AMENDMENTS TO THE SPECIFICATION

Please amend the specification as follows:

Amend the paragraph [0025] beginning on page 8, lines 6, through, line 34, as follows:

[0025] In view of the problems mentioned above, it is also an object of the present invention to provide a magnetic thin film of high spin polarizability, and a magnetoresistance effect device and a magnetic device using the same. In order to achieve the objects mentioned above, a spin injection device ~~as set forth in claim 1 is~~ that [[it]] comprises a spin injection part having a spin polarizing part and an injection junction part, and SyAF having a first magnetic layer and a second magnetic layer having different magnitudes of magnetization, and magnetically coupled together antiparallel to each other via a nonmagnetic layer, wherein: said SyAF and said injection junction part are bonded, and a spin polarization electron is injected from said spin injection part, and magnetization of said first and second magnetic layers is reversed while maintained in antiparallel state. In addition to the structure described above, the injection junction part of said spin injection part is either a nonmagnetic conductive layer or a nonmagnetic insulating layer. Said spin polarization electron is capable of spin conservation conduction or tunnel junction at the injection junction part of said spin injection part. The spin polarization part of said spin injection part is a ferromagnetic layer. The spin polarization part of said spin injection part is provided in contact with an antiferromagnetic layer that fixes the spin of a ferromagnetic layer. Further, the aspect ratio of the first and the second magnetic layers of

SyAF in contact with the injection junction part of said spin injection parts may be less than 2. In such structure of a spin injection device, when a spin is injected from a spin polarization part via an injection junction part, the spin of SyAF is magnetization-reversed while maintaining antiparallel state. Therefore, the spin injection device of the present invention can exhibit magnetic reversal with lower current density.

Amend the paragraph [0026] beginning on page 8, line 35, through page 9, lines 1-30, as follows:

[0026] A spin injection magnetic apparatus ~~as set forth in claim 7 is so made up that it~~ comprises a free layer having the first and the second magnetic layers coupled together magnetically antiparallel to each other via a nonmagnetic layer, and in which magnitudes of magnetization are different, and the magnetization of said first and the second magnetic layers is capable of magnetization reversal while maintaining the antiparallel state, and a ferromagnetic fixed layer tunnel-junctioned with said free layer via an insulating layer, wherein: aid ferromagnetic fixed layer and said free layer are made to be a ferromagnetic spin tunnel junction. In addition to the structure described above, the spin injection part having an injection junction part bonded to a free layer and a spin polarization part may be provided. The injection junction part of a spin injection part may be either nonmagnetic conductive layer or nonmagnetic insulating layer. The spin polarization electrons may be capable of spin conservation conduction or tunnel junction at an injection junction part of a spin injection part. The spin polarization part of a spin injection part may also be a ferromagnetic layer. The spin polarization part of a spin injection part may be

provided in contact with an antiferromagnetic layer that fixes the spin of a ferromagnetic layer. The aspect ratio of the first and the second magnetic layers of the free layer in contact with the injection junction part of said spin injection part may be less than 2. The injection junction part of a spin injection part may be word line. In such structure of a spin injection magnetic apparatus, if a spin is injected, the magnetization-reversal of the free layer is occurred. And the tunnel magnetoresistance effect appears due to the magnetization of the free layer becoming parallel or antilarallel with respect to the magnetization of the fixed layer. Therefore, the spin injection magnetic apparatus of the present invention can cause magnetic reversal of a free layer with lower current density by spin injection.

Amend the paragraph [0027] beginning on page 9, line 31, through page 10 lines 1-8 as follows:

[0027] A spin injection device ~~as set forth in claim 15~~ is characterized in that, in a spin injection device comprising a spin injection part having a spin polarization part including a ferromagnetic fixed layer and an injection junction part of a nonmagnetic layer, and a ferromagnetic free layer provided in contact with said spin injection part, wherein: said nonmagnetic layer is made of an insulator or a conductor, a nonmagnetic layer is provided on the surface of said ferromagnetic free layer, and an electric current flows in the direction perpendicular to the film surface of said spin injection device in order to reverse a magnetization of said ferromagnetic free layer. Here, the ferromagnetic free layer is of Co or Co alloy, the nonmagnetic layer on the surface of ferromagnetic free layer is Ru layer, and its film thickness is preferably 0.1 - 20 nm.

Amend the paragraph [0028] beginning on page 10, lines 9-26 as follows:

[0028] A spin injection device ~~as set forth in claim 17~~ is characterized in that, in a spin injection device comprising a spin injection part having a spin polarization part including a ferromagnetic fixed layer and an injection junction part of a nonmagnetic layer, and a ferromagnetic free layer provided in contact with said spin injection part, wherein: said nonmagnetic layer is made of an insulator or a conductor, a nonmagnetic and a ferromagnetic layers are provided on the surface of said ferromagnetic free layer, and an electric current flows in the direction perpendicular to the film surface of said spin injection device in order to reverse a magnetization of said ferromagnetic free layer. Said ferromagnetic free layer and said ferromagnetic layer are of Co or Co alloy, a nonmagnetic layer on the surface of said ferromagnetic free layer is Ru layer, and its film thickness may be 2 - 20 nm. In such structure of a spin injection device, when a spin is injected from a spin polarization part via an injection junction part, the magnetization of the ferromagnetic free layer is reversed. Therefore, the spin injection device of the present invention can exhibit magnetic reversal with lower current density.

Amend the paragraph [0029] beginning on page 10, line 27 through page 11 lines 1-2 as follows:

[0029] ~~A spin injection magnetic apparatus as set forth in claim 19 uses the spin injection device as set forth in either of said claims 15 – 18.~~ In such structure of the spin injection magnetic apparatus, when a spin is injected, the magnetization reversal of a ferromagnetic free layer is

occurred. And either giant magnetoresistance effect or tunnel magnetoresistance effect appears due to the magnetization of the free layer becoming parallel or antilarallel with respect to the magnetization of the fixed layer. Therefore, the spin injection magnetic apparatus of the present invention can exhibit the magnetic reversal of the ferromagnetic free layer by spin injection with lower current density.

Amend the paragraph [0030] beginning on page 11, lines 3-13 as follows:

[0030] ~~A spin injection magnetic memory device as set forth in claim 20 uses the spin injection device as set forth in any one of claims 15 to 18.~~ In such structure of the spin injection magnetic memory device, when a spin is injected, the magnetization reversal of a ferromagnetic free layer is occurred, and either giant magnetoresistance effect or tunnel magnetoresistance effect appears due to the magnetization of the free layer becoming parallel or antilarallel with respect to the magnetization of the fixed layer. Therefore, the spin injection magnetic memory device of the present invention can offer a memory device owing to magnetic reversal of the ferromagnetic free layer by spin injection with lower current density.

Amend the paragraph [0032] beginning on page 11, lines 19-31 as follows:

[0032] The object mentioned above is achieved with a magnetic thin film ~~as set forth in claim 21~~ that [[it]] comprises a substrate, and Co2$Fe_xCr_{1-x}Al$ thin film formed on said substrate, and said $Co_2Fe_xCr_{1-x}Al$ thin film has either of structures $L2_1$, B2, and A2, and in which x is $0 \leqq x \leqq 1$. In the aspect mentioned above, $Co_2Fe_xCr_{1-x}Al$ thin film can be formed without heating a substrate.

Said substrate may be either one of thermally oxidized Si, glass, MgO single crystal, GaAs single crystal, or Al_2O_3 single crystal. The buffer layer may be provided between the substrate and $Co_2Fe_xCr_{1-x}Al$ thin film. As said buffer layer, at least one of Al, Cu, Cr, Fe, Nb, Ni, Ta, and NiFe may be used. According to this aspect, $Co_2Fe_xCr_{1-x}Al$ magnetic thin film (where $0 \leqq x \leqq 1$), which is a ferromagnet at room temperature and has high spin polarizability, can be obtained.

Amend the paragraph [0033] beginning on page 11, line 32 through page 12, lines 1-12 as follows:

[0033] A tunnel magnetoresistance effect ~~device as set forth in claim 26 is characterized in that it~~ that has a plurality of ferromagnetic layers on a substrate, at least one of the ferromagnetic layers is $Co_2Fe_xCr_{1-x}Al$ magnetic thin film (where $0 \leqq x \leqq 1$) having either one of structures $L2_1$, B2, and A2. Said ferromagnetic layer consists of a fixed and a free layers, and said free layer is preferably Co_2FexCr1-xAl magnetic thin film (where $0 \leqq x \leqq 1$) having either one of structures $L2_1$, B2, and A2. $Co_2Fe_xCr_{1-x}Al$ thin film can be formed without heating a substrate. In this case, the substrate may be either one of thermally oxidized Si, glass, MgO single crystal, GaAs single crystal, or Al_2O_3 single crystal. The buffer layer may be provided between the substrate and $Co_2Fe_xCr_{1-x}Al$ thin film. Said buffer layer may be made up with at least one of Al, Cu, Cr, Fe, Nb, Ni, Ta, and NiFe. According to the aspect mentioned above, the tunnel magnetoresistance effect device with large TMR in low external magnetic field can be obtained at room temperature.

Amend the paragraph[0035] beginning on page 12, line 30 through page 13, lines 1-15 as follows:

[0035] A magnetic device ~~as set forth in claim 38 is~~ characterized in that it is formed with $Co_2Fe_xCr_{1-x}Al$ magnetic thin film ($0 \leqq x \leqq 1$) having either of structures $L2_1$, B2, and A2 being formed on a substrate. In this case, the tunnel magnetoresistance effect device or the giant magnetoresistance effect device, of which a free layer is made of said $Co_2Fe_xCr_{1-x}Al$ magnetic thin film ($0 \leqq x \leqq 1$), may be used. The tunnel magnetoresistance effect device or the giant magnetoresistance effect device is preferably fabricated without heating a substrate. Also the tunnel magnetoresistance effect device or giant magnetoresistance effect device, which has a buffer layer provided between the substrate and $Co_2Fe_xCr_{1-x}Al$ thin film ($0 \leqq x \leqq 1$), may be used. The tunnel magnetoresistance effect device or the giant magnetoresistance effect device, in which said substrate is either one of thermally oxidized Si, glass, MgO single crystal, GaAs single crystal, or Al_2O_3 single crystal, may be used. The tunnel magnetoresistance effect device or the giant magnetoresistance effect device, in which at least one of Al, Cu, Cr, Fe, Nb, Ni, Ta, and NiFe is used as the buffer layer, may be used. According to the aspect mentioned above, the magnetic device that uses a magnetoresistance effect device with large TMR and GMR in low external magnetic field can be obtained at room temperature.

Amend the paragraph [0036] beginning on page 13, line 16 through page 14, lines 1-4 as follows:

[0036] A magnetic head and a magnetic recording apparatus ~~as set forth in claim 44 are~~ characterized in that $Co_2Fe_xCr_{1-x}Al$ magnetic thin film (where $0 \leqq x \leqq 1$) having either of structures $L2_1$, B2, and A2 is formed on a substrate. According to the aspect mentioned above, said tunnel magnetoresistance effect device or giant magnetoresistance effect device, in which a free layer is said $Co_2Fe_xCr_{1-x}Al$ magnetic thin film (where $0 \leqq x \leqq 1$), is preferably used. Said tunnel magnetoresistance effect device or the giant magnetoresistance effect device, which is manufactured without heating a substrate, may also be used. Also the tunnel magnetoresistance effect device or the giant magnetoresistance effect device, which has a buffer layer provided between the substrate and $Co_2Fe_xCr_{1-x}Al$ thin film ($0 \leqq x \leqq 1$), may be used. The tunnel magnetoresistance effect device or the giant magnetoresistance effect device, in which a substrate is either one of thermally oxidized Si, glass, MgO single crystal, GaAs single crystal, or Al_2O_3 single crystal, may be used. Further, the tunnel magnetoresistance effect device or the giant magnetoresistance effect device, in which a buffer layer is made of at least one of Al, Cu, Cr, Fe, Nb, Ni, Ta, and NiFe, may be used. According to the aspect mentioned above, the magnetic head and the magnetic recording apparatus of large capacity and high speed can be obtained by using a magnetoresistance effect device with large TMR and GMR in low external magnetic field at room temperature.